

Introduction

- Fragile X syndrome is the leading inherited cause of intellectual disability, impacting approximately 1 in every 2,500 males (Hagerman, 2002).
- In terms of syntax, some children demonstrate a profile similar to Specific Language Impairment, with particular difficulties in verb endings (e.g., He walks to the store). However, there is a lack of research on appropriate methods for assessment of these structures.
- A significant number of males have a co-diagnosis of autism (25-40%). Research is mixed on the impact of autism on FXS in terms of the language phenotype (Hatton et al., 2006).
- Thus, the **purpose of this study** is to 1) characterize the language profile of FXS in terms of syntactic abilities for males with and without autism, and 2) compare different methods for assessment of syntax.

Participant Inclusion Criteria

- FXS: genetic testing to determine full mutation status
- English primary language spoken by the participant
- Spontaneous expressive language of at least 2-3 word utterances
- Boys between 9 and 16 years of age
 - Due to the gender differences in FXS, the current study focused only on boys

Characteristic	Group	
	FXS-No Autism (n = 11)	FXS+ASD (n = 8)
Chronological Age (years)		
Mean	11.93	13.33
SD	1.90	2.56
Leiter (standard score)¹		
Mean	51.00	44.50
SD	7.89	7.46
EVT (standard score)²		
Mean	69.64	57.00
SD	8.04	15.77
PPVT (standard score)³		
Mean	68.73	52.50
SD	9.38	19.67
MLU Conversation Sample		
Mean	3.99	2.85
SD	1.33	.79

¹Leiter International Performance Scale-Revised (Roid & Miller, 1997)

²Expressive Vocabulary Test (Williams, 2007)

³Peabody Picture Vocabulary Test-3rd Edition (Dunn & Dunn, 2007)

Method

- Assessments completed at the Waisman Center
- Participants completed norm-referenced tests including nonverbal IQ (Leiter), receptive and expressive vocabulary (PPVT and EVT), expressive syntax (TEGI), the Childhood Autism Rating Scale (CARS) as well as a conversation language sample and sentence imitation task

Primary Measures

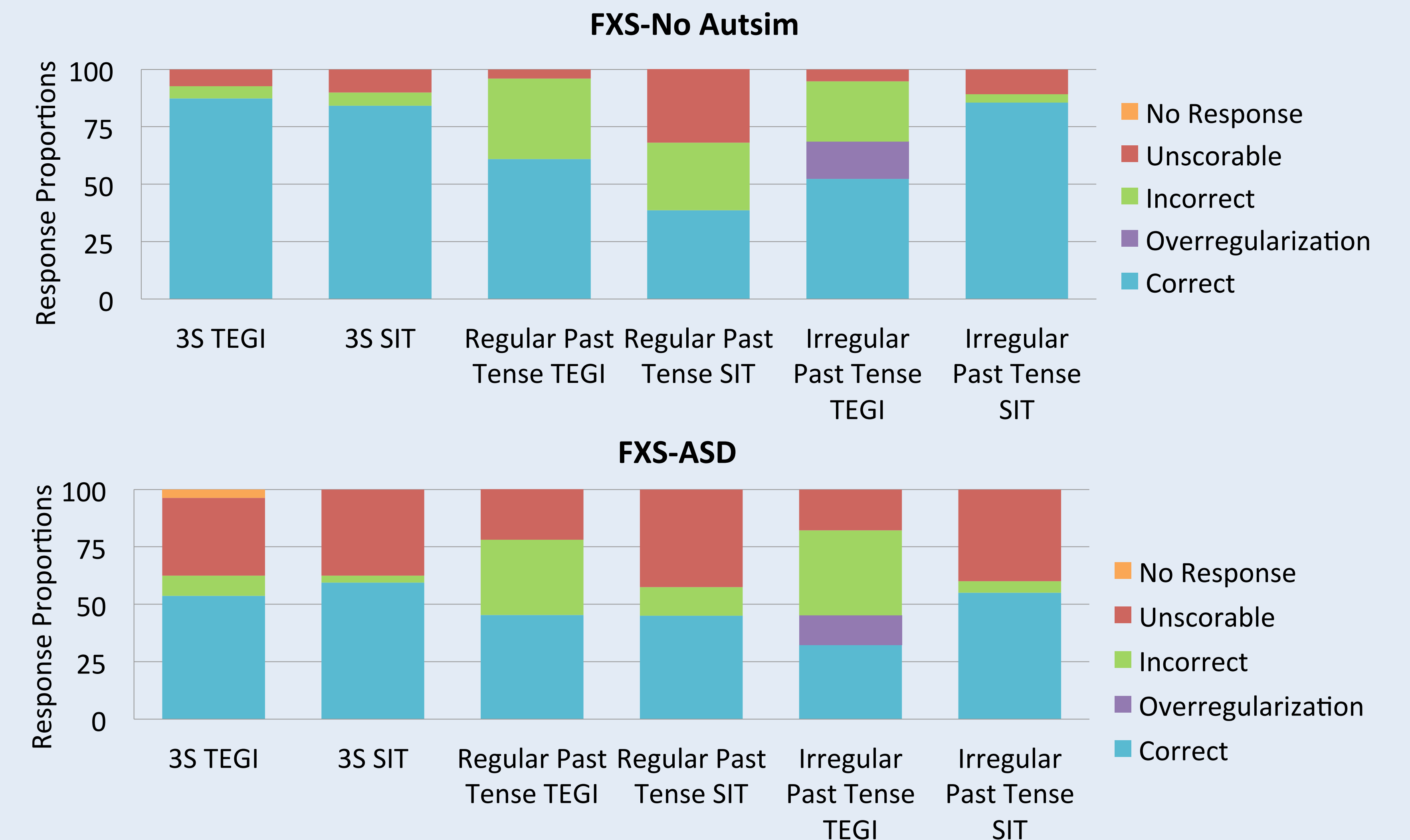
- Childhood Autism Rating Scale (CARS; Schopler et al., 2001)
 - Scores above 30 considered FXS+Autism
- Test of Early Grammatical Impairment (TEGI; Rice & Wexler, 2001)
 - Third Person Singular (3S) , Past-tense , and BE/DO Morphological probes
 - Percent correct of scorable items in obligatory contexts
- Sentence Imitation Task
 - 30 sentences including target forms of third person singular (3S), Past Tense, BE and DO
 - Percent correct of scorable items in obligatory context

TEGI vs. SIT Total Scores

		FXS-No Autism	FXS+ASD
TEGI 3S*	Mean	93.64	78.20
	SD	9.24	34.40
SIT 3S*	Mean	93.83	96.43
	SD	9.56	6.10
TEGI Regular Past Tense*	Mean	63.81	53.01
	SD	33.75	42.48
SIT Regular Past Tense*	Mean	42.00	80.00
	SD	47.56	28.28
TEGI Irregular Past Tense	Mean	53.65	36.57
	SD	24.88	19.80
SIT Irregular Past Tense	Mean	95.15	92.00
	SD	11.19	10.95
TEGI BE	Mean	87.48	76.87
	SD	16.49	24.84
SIT BE	Mean	100	100
	SD	0	0
TEGI DO	Mean	53.38	38.49
	SD	33.31	40.64
SIT DO	Mean	100	100
	SD	0	0

Assessment measures are correlated for FXS-No Autism group: 3S $r = .60^$; Regular Past Tense $r = .63^*$

Error Analysis



Conclusions

- While nonverbal IQ is similar between the two groups, the boys with FXS-No Autism have much higher language abilities as indexed by the PPVT, EVT, and MLU. Preliminary results indicate a language “advantage” on standardized scores for the FXS-No Autism group.
- The boys with FXS-No Autism had slightly better total scores on the TEGI, although the trend is similar between the two groups. The total scores for the Sentence Imitation Task are strikingly similar. Of note, while BE is a relative strength in this sample, DO appears to be a particularly difficult structure regardless of autism status.
- The error analysis reveals that the boys with FXS-No Autism produced more scorable responses on both the standardized measure and the SIT task. Both groups produced between 60-90% scorable responses on both types of probes.
- This study is ongoing and will continue to enroll participants, as well as examine differences in language on the ADOS and conversation language samples.

Acknowledgments

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